What is claimed is:

[Claim 1] 1. A method for re-orientating digital images comprising the following steps:

analyzing an image stored in a computer readable media and determining an image re-orientation requirement according to an image analysis output;

determining a direction of re-orientation of the image according to the re-orientation requirement; and

re-orientating the image according to the determined direction of re-orientation.

[Claim 2] 2. The method of claim 1, wherein the analyzing step includes comparing properties of the image to predefined values and deriving comparison values, determining whether an image analysis process can be omitted according to the comparison values and if so, determining a re-orientation requirement according to the comparison values.

[Claim 3] 3. The method of claim 1, wherein the analyzing step includes an image analysis process to determine an axis weighting potential for a first axis and an axis weighting potential for a second axis, and the re-orientation requirement is determined according to the axis weighting potentials for the first and second axes and a predetermined value.

[Claim 4] 4. The method of claim 3, wherein the first and second axes are mutually perpendicular.

[Claim 5] 5. The method of claim 3, wherein the image analysis process is an image zone analysis process comprising the following steps:

analyzing a plurality of image zones of the image to realize a plurality of zone element values;

comparing the zone element values returned from the analyzing step to predetermined image element values and determining a class probability rating for each image element class of a plurality of image element classes for each image zone;

selecting the image element class with the highest class probability rating for each image zone;

comparing the highest class probability rating for each image zone to a predetermined value and, if the class probability ratings are greater than the predetermined value, generating a zone potential rating for each image zone according to the probability rating for the selected image element class and a table of predetermined factors; and

calculating an axis weighting potential for the first axis and the second axis of the image from the corresponding zone potential ratings.

[Claim 6] 6. The method of claim 3, wherein the image analysis process is an image zone analysis process comprising the following steps:

analyzing a plurality of image zones of the image to realize a plurality of zone element values;

comparing the zone element values returned from the analyzing step to predetermined image element values and determining a class probability rating for each image element class of a plurality of image element classes for each image zone;

comparing the class probability ratings for each image zone to a predetermined value and, if the class probability ratings for each image zone are greater than the predetermined value, generating a zone potential rating for each image zone by

multiplying the class probability rating of each image element class by corresponding values for each image element class stored in a table of predetermined factors and selecting the image element class with the highest class probability rating; and

calculating an axis weighting potential for the first axis and the second axis of the image from the corresponding zone potential ratings.

[Claim 7] 7. The method of claim 3, wherein the image analysis process is a facial feature analysis process comprising the following steps:

analyzing the image to determine the size and orientation of facial features, and to derive a significance value for the facial features; and

comparing the significance value to a predetermined value and, if the significance value is greater than the predetermined value, calculating a weighting potential for the first axis and the second axis of the image according to the size and orientation of the facial features.

[Claim 8] 8. The method of claim 3, wherein the image analysis process comprises an image zone analysis process and a facial feature analysis process.

[Claim 9] 9. The method of claim 8, wherein the image analysis process includes comparing an output of one of the processes to a predefined value and deriving a comparison value, and determining whether the other process can be omitted according to the comparison value.

[Claim 10] 10. The method of claim 1, wherein in the determining step, the direction of re-orientation of the image is determined by comparing axis weighting potentials of the first and second axes to determine a dominant axis and determining the direction of re-orientation of the image such that the dominant axis will appear in a vertical viewing plane according to the axis weighting potential of the dominant axis.

[Claim 11] 11. The method of claim 1, wherein in the analyzing step, the image re-orientation requirement is derived by comparing the outputs of a facial feature analysis process and an image zone analysis process with predetermined values to determine an order of significance for each process, and using axis weighting potential values from a most significant process to determine the image re-orientation requirement.

[Claim 12] 12. The method of claim 3, wherein at least a predefined value is an adaptive threshold.

[Claim 13] 13. A method for re-orientating digital images comprising the following steps:

analyzing an image stored in a computer readable media by an image analysis process comprising an image zone analysis process for determining an axis weighting potential for a first axis and an axis weighting potential for a second axis, an image re-orientation requirement being determined according to the axis weighting potentials for the first and second axes, and a predetermined value;

determining a direction of re-orientation of the image according to the re-orientation requirement, the direction of re-orientation of the image being determined by comparing axis weighting potentials of the first and second axes to determine a dominant axis and determining the direction of re-orientation of the image such that the dominant axis will appear in a vertical viewing plane according to the axis weighting potential of the dominant axis; and

re-orientating the image according to the determined direction of re-orientation.

[Claim 14] 14. The method of claim 13, wherein the analyzing step includes comparing properties of the image to predefined values and deriving comparison values, determining whether an image analysis process can be omitted according to the comparison values, and if so, determining a re-orientation requirement according to the comparison values.

[Claim 15] 15. The method of claim 13, wherein the first and second axes are mutually perpendicular.

[Claim 16] 16. The method of claim 13, wherein the image zone analysis process comprises the following steps:

analyzing a plurality of image zones of the image to realize a plurality of zone element values;

comparing the zone element values returned from the analyzing step to predetermined image element values and determining a class probability rating for each image element class of a plurality of image element classes for each image zone;

selecting the image element class with the highest class probability rating for each image zone;

comparing the highest class probability rating for each image zone to a predetermined value and, if the class probability ratings are greater than the predetermined value, generating a zone potential rating for each image zone according to the probability rating for the selected image element class and a table of predetermined factors; and

calculating an axis weighting potential for the first axis and the second axis of the image from the corresponding zone potential ratings.

[Claim 17] 17. The method claim 13, wherein the image zone analysis process comprises the following steps:

analyzing a plurality of image zones of the image to realize a plurality of zone element values;

comparing the zone element values returned from the analyzing step to predetermined image element values and determining a class probability rating for each image element class of a plurality of image element classes for each image zone;

comparing the class probability ratings for each image zone to a predetermined value and, if the class probability ratings for each image zone are greater than the predetermined value, generating a zone potential rating for each image zone by multiplying the class probability rating of each image element class by corresponding values for each image element class stored in a table of predetermined factors and selecting the image element class with the highest class probability rating; and

calculating an axis weighting potential for the first axis and the second axis of the image from the corresponding zone potential ratings.

[Claim 18] 18. The method of claim 13, wherein the image analysis process further comprises a facial feature analysis process having the following steps:

analyzing the image to determine the size and orientation of facial features, and to derive a significance value for the facial features; and

comparing the significance value to a predetermined value and, if the significance value is greater than the predetermined value, calculating a weighting potential for the first axis and the second axis of the image according to the size and orientation of the facial features.

[Claim 19] 19. The method of claim 18, wherein the image analysis process includes comparing an output of one of the processes to a predefined value and deriving a comparison value, and determining whether the other process can be omitted according to the comparison value.

[Claim 20] 20. The method of claim 13, wherein in the analyzing step, the image re-orientation requirement is derived by comparing the outputs of a facial feature analysis process and an image zone analysis process with predetermined values to determine an order of significance for each process, and using axis weighting potential values from a most significant process to determine the image re-orientation requirement.